

Changing household characteristics and the away-from-home food market: a censored equation system approach[☆]

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Abstract

The American consumer is obtaining more-and-more of his or her food at a restaurant, and that worries some people concerned with the Nation's dietary health. To date, much of this concern seems to be directed at the fast food segment of the restaurant industry. This paper asks whether targeting one segment of the industry, such as fast food restaurants, is justified, or whether a more balanced view of eating away from home is required. To answer this question, we look to the future and ask whether Americans can be expected to purchase increasingly more fast food or more-and-more of the foods typically associated with full-service dining. One view is that sales at full-service restaurants will now grow relatively faster than sales of fast food. The argument supporting this position rests on rising incomes, the aging of the population, smaller household sizes, and other changes taking place in the population. Using a new full-information maximum likelihood procedure for

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estimating a system of censored expenditure equations, we find evidence to support this argument.

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Introduction

Consumers in the US are obtaining more-and-more of their food at restaurants, and that worries some people. Americans now consume about one-third of their calories away from home as compared with about 18% in the 1970s (Guthrie et al., 2002). Such growth has raised concern about how the health of consumers will be affected, because away-from-home foods are generally less healthful than at-home foods (e.g., Guthrie et al., 2002; Lin and Frazao, 1999). To date, much of this concern seems to be directed at the fast food segment of the restaurant industry. Lawsuits have been levied against major fast food chains, and researchers have implicated these same chains in the increased incidence of obesity (Chou et al., 2004). Is an emphasis on a single segment of the restaurant industry, such as fast food, justified, or should those concerned with the Nation's dietary health take a broader view of the restaurant industry? Research suggests that the nutritional quality of fast food is not poorer than that of meals and snacks traditionally consumed at full-service restaurants, although the two types of foods have different nutritional characteristics (Lin and Frazao, 1999). Another way to answer this question looks to the future, and asks whether Americans can be expected to purchase increasingly more fast food or more-and-more of the foods typically associated with full-service dining.

A diverse array of foodservice firms comprise the away-from-home market, such as full-service restaurants, fast food establishments, hotels, retail stores, recreation places, and bars. However, as of 2003, full-service and fast food restaurants had captured the bulk of the market with 40.4% and 38.3% of total sales, respectively (Clauson, 2004). Not only do these two categories of facility supply different foods and services, but the foods from these sources have different nutrient characteristics. Both types of away-from-home food are generally less healthful than at-home foods, while, compared to each other, full-service meals and snacks tend to be higher in fat, cholesterol, and sodium, but lower in saturated fats (Lin and Frazao, 1999).

Fast food outlets used to comprise the quickest growing segment of the away-from-home market. Annual spending for fast food increased relatively quickly from 29% of all away-from-home food sales in 1980 to over 38% in 1995 (Clauson, 2004). Jekanowski et al. (2001) show that this growth was driven by fast food companies building more outlets closer to where people live and work. Increased accessibility enhanced the convenience associated with fast food. Members of the popular press have echoed this same view in publications like *Fast Food Nation* (Schlosser, 2001).

Rapid growth has led to criticisms of the industry, however. Fast food restaurant companies have been criticized for an alleged impact on consumers' health. Major chains, such as McDonald's, have been targeted by lawsuits as well as by the media. Recently, for example, members of the press have tried to implicate fast food restaurants in a well-publicized cardiovascular incident involving former President Bill Clinton. Commenting on the likely reasons why the former President needed heart surgery, one media source notes that Clinton "was lampooned during his presidency for his inability to resist fatty fast food. . ." (e.g., [MSNBC News, September 8, 2004](#)). Criticism of the fast food industry extends further to researchers. Studies have identified fast food as a "culprit" in the increasing incidence of obesity ([Chou et al., 2004, p. 584](#)). [Chou et al. \(2004\)](#) note that the rapid increase in the number of fast food establishments operating in the US over the past several decades has increased people's access to restaurant food. These researchers then find a positive association between access to restaurant food and a person's body mass index as well as his or her likelihood of obesity.

The irony is that fast food restaurants no longer appear to be improving upon their share of the total away-from-home market through increased outlet density. Since 1995, the fast food share of the foodservice market has remained relatively stable, while that of full-service restaurant companies has edged slightly higher ([Clau-son, 2004](#)). One view, expressed by the [National Restaurant Association \(1999\)](#), is that consumer expenditures on full-service meals and snacks are now growing relatively faster than sales of fast food. The argument supporting this position rests on rising incomes, the aging of the population, and smaller household sizes – all factors believed to favor increased demand for the kinds of services and varied menus traditionally available at full-service restaurants.

An accurate assessment of what types of away-from-home foods Americans will purchase, and why they choose those foods, is important as social marketers with health-oriented government agencies look to improve upon the Nation's eating habits. A working group on obesity at the US Food and Drug Administration, for one, has recommended developing more social marketing programs similar to the "Power of Choice" program ([US Food and Drug Administration, 2004](#)). This campaign teaches adolescents how to make smart food and physical activity choices in real-life settings. Marketing materials include strategies to teach young people about making healthy choices vis-à-vis fast food restaurants ([Food and Nutrition Service, 2003](#)). Perhaps, for adolescents, an emphasis on fast food is best. However, in dealing with adults, a properly crafted social marketing campaign may want to take a broader view of away-from-home eating. That campaign may further want to take stock of any demographic factors shaping behavior along with the demand for convenience.

The goal of this study is to identify how economic and demographic changes in the population of the US are affecting demand for foods and services at fast food and full-service restaurants. To this end, household survey data are used to estimate a system of equations for household expenditures at both types of facility. We then examine these results in combination with projections about how the population of the US is changing.

A second contribution of the study is to accommodate reported zero expenditures in estimating the aforementioned system of equations. A multivariate generalization of the sample-selection model of Heckman (1979) and the Tobit system of Amemiya (1974), the proposed full-information maximum-likelihood (FIML) estimator is a more efficient alternative to the two-step estimator of Shonkwiler and Yen (1999), which has been recently applied in several demand studies (e.g., Su and Yen, 2000; Yen et al., 2002).

Theory and data

Economic and demographic changes in the population of the US may be leading to changes in demand for food-away-from-home that will affect how much households spend on fast food and at full-service restaurants. These developments include changes in income, age, household size, and the proportion of households which can be characterized as consisting of single people or households containing multiple adults but no live-at-home children. Classical demand theory demonstrates how these characteristics of a household may influence the household's demand for goods and services in general. An extension of classical demand theory, the theory of household production, further shows how these same attributes can affect a household's demand for food-away-from-home.

Household production theory posits that the costs of consumption can include prices as well as time spent eating food, preparing food, and cleaning up after a meal or snack. A household must therefore decide whether to spend time on all aspects of the activity of eating a meal (i.e., prepare food-at-home) or outsource some aspects like preparation and cleaning up (i.e., purchase food-away-from-home). The optimal decision depends on many factors, such as the household's finances, time constraints, and how well the household manager can cook. In the context of this model, a household manager can be defined as the person primarily responsible for cooking and other domestic affairs.

Existing studies have further identified some of the economic and demographic characteristics most likely to influence a household's demand for meals and snacks at different types of facility. In particular, McCracken and Brandt (1987) as well as Byrne et al. (1998) analyzed the relationship between key household characteristics and expenditures by type of restaurant. Nayga and Capps (1994) studied the relationship between such variables and the number of eating occasions at fast food and full-service establishments. Hiemstra and Kim (1995) analyzed the impact of some key variables on expenditures by eating occasion and market segment. However, these studies all relied on data from the 1970s and 1980s, which may not be ideal for understanding current developments in the two largest segments of today's away-from-home market, namely fast food and full-service restaurants.

Models of demand for away-from-home foods can be estimated with household survey data, such as the Consumer Expenditure Survey (CE). The CE, administered by the US Bureau of Labor Statistics (BLS, 1998, 1999, 2000), covers an annual rep-

Table 1
Variables measuring expenditures and household characteristics

Variable	Mean	Definition
Expenditures		
Full-service	8.43	Per capita, average weekly, spending at full-service restaurants (\$)
Fast food	8.15	Per capita, average weekly, spending on fast food (\$)
Household characteristics		
Income	0.42	Household's per capita, average weekly, real, pre-tax income (1000s of \$)
Hours worked by manager	2.42	Hours spent in the labor force by the household manager (10 of hours)
Age of manager	4.76	The age of the household manager (decades)
College-educated manager	0.25	Equals 1 if household manager has a college education, 0 otherwise
Size of household	0.26	The number of people living in the household (10s of people)
Race		
Asian	0.05	Equals 1 if respondent or spouse (if married) is Asian, 0 otherwise
Black	0.09	Equals 1 if respondent or spouse (if married) is Black, 0 otherwise
Hispanic	0.11	Equals 1 if respondent or spouse (if married) is Hispanic, 0 otherwise
Household type		
Single	0.28	Equals 1 if respondent lives alone, 0 otherwise
Multiple adults, no children	0.35	Equals 1 if respondent lives with another adult(s) but no children, 0 otherwise
Single parent	0.10	Equals 1 if respondent is unmarried with live-at-home children, 0 otherwise
Traditional	0.27	Omitted reference household type
Region of residence		
West	0.27	Equals 1 if household lives in the West, 0 otherwise
South	0.31	Equals 1 if household lives in the South, 0 otherwise
Midwest	0.24	Equals 1 if household lives in the Midwest, 0 otherwise
North	0.18	Omitted reference region
Season		
Winter	0.26	Equals 1 if household completed the survey in the winter, 0 otherwise
Spring	0.24	Equals 1 if household completed the survey in the spring, 0 otherwise
Summer	0.24	Equals 1 if household completed the survey in the summer, 0 otherwise
Fall	0.26	Omitted reference season
Year		
Year 2000	0.36	Equals 1 if household completed the survey in 2000, 0 otherwise
Year 1999	0.36	Equals 1 if household completed the survey in 1999, 0 otherwise
Year 1998	0.28	Omitted reference year

representative sample of non-institutional households. In the diary section of the survey, each household reports their away-from-home expenditures. These data can also be matched with household characteristics such as income, number of members, region

of residence, and race. In this study, we use data from the CE for 1998, 1999, and 2000.² Table 1 provides the definitions and means of variables used in this study.

The dependent variables in our study are household weekly per capita expenditures on fast food and at full-service restaurants, inflated by the Consumer Price Index (fourth quarter of 2000 = 100). Among the explanatory variables, income is a key variable. We hypothesize that foodservice meals and snacks can be a form of leisure where leisure is defined as time spent outside of both the labor force and household production. Both fast food and full-service restaurants can provide leisure for a household manager who is freed from cooking, cleaning and shopping. Moreover, along with the additional leisure, households with higher income may buy more of other goods like variety and dining amenities. In fact, households with higher income have been shown to have higher expenditures for both fast food and full-service meals and snacks, but spending at full-service restaurants has been shown to be most responsive to changes in income (McCracken and Brandt, 1987; Byrne et al., 1998).

It is also hypothesized that households may eat away-from-home on more occasions as their manager works longer hours outside the home.³ Fast food may come to represent an increasingly convenient meal option for such households. In fact, during a survey period of fixed length, the likelihood that a household consumes some fast food has been shown to increase along with the number of hours worked by its manager in the labor force (Byrne et al., 1998). By contrast, because dining at a full-service restaurant can take as long as eating at home, the relationship between a household's frequency of dining at full-service restaurants and its time constraints is not as clear.

Our model also includes the number of people living in the household. The reason is that, as a household adds more members, there may be economies of scale associated with meal preparation at home. Larger households can also benefit from cost savings associated with larger package sizes. In total, single-person households will likely have the highest per person time and monetary costs for eating at home while larger households will incur lower costs per capita. In support of this argument, empirical studies suggest that larger households tend to spend less money per capita away-from-home in both market segments (McCracken and Brandt, 1987).

The age of the household manager is also included in the model. If learning improves upon one's efficiency at preparing food at home, households with older managers may cook more often, whereas households with younger managers may purchase more convenience items such as fast food. There may also be changes in the tastes of household members as they age. For example, if the sensitivity of one's taste buds tend to diminish with age, older people may demand foods with bolder flavors (Friddle et al., 2001).

² After removing households with incomplete information on key characteristics and/or negative incomes from the sample, the data include about 5000 households for each year.

³ The CE does not explicitly identify each household's manager. For the purposes of this study, we consider the survey respondent to be their household's manager, if they are single. For married respondents, the household manager is assumed to be the spouse who works outside the home for the least number of hours.

We also include variables to capture the structure of each household. We define a “traditional” household to be a family comprised of a married couple with live-at-home children. The decreasing frequency of traditional households and increasing incidence of alternative types of household has been identified as one of the demographic changes occurring in the population of the US (Kinsey, 1990). We allow for three types of non-traditional households, i.e., households with a single person, a single-parent with children, or multiple adults without live-at home children. Notably, all households were classified as belonging to either one of these three types or as being traditional. Dummy variables were then included in the model for each household type with traditional households being the reference group.

Other variables considered include whether the household manager had completed college or attained a higher level of education, region of residence, the year survey was completed, the season survey was completed, and whether the household was described as belonging to a minority group including Black, Asian and Hispanic.⁴

Estimation of systems of equations with household survey data is complicated by the fact that many households do not spend any money at one or both types of facility. During their two-week survey period, 79% of households completing the CE consumed fast food and 55% spent some money at a full-service restaurant. We accommodate the observed zero expenditures in the sample by developing a new censored-system estimator, described below.

A multivariate sample selection model

The multivariate Tobit system proposed by Amemiya (1974) accommodates censored dependent variables in an equation system. Application of this estimator, however, has been hindered by the need to evaluate multiple probability integrals, although recent development in simulation estimation (Hajivassiliou, 1994) helps overcome some of these numerical difficulties. Practical approaches to maximum-likelihood estimation of Amemiya's (1974) estimator include the quasi maximum-likelihood procedure of Yen and Lin (2002) and two-step procedure of Perali and Chavas (2000). As in its single-equation counterpart, Amemiya's (1974) multivariate Tobit system features the potentially restrictive parametric restriction that censoring is governed by the same stochastic process that determines the level of the dependent variables (see, e.g., Lin and Schmidt, 1984). Shonkwiler and Yen (1999) suggested a model that overcomes the parametric restriction of Amemiya's (1974) Tobit system, and proposed a two-step procedure to estimate a censored system of equations. As in other two-step procedures, however, Shonkwiler and Yen's (1999) two-step estimator is statistically inefficient. We propose a FIML procedure that is statistically efficient.

⁴ The CE does not contain information on prices. Thus, we include indicator variables to control for annual, seasonal, and regional price differences. This same assumption is implicitly made in other studies of the away-from-home market (e.g., McCracken and Brandt, 1987; Byrne et al., 1998).

Consider a system of n equations in which each dependent variable y_i is generated by the regressors x , unobservable error term v_i , and an indicator variable d_i such that

$$y_i = d_i(x'\beta_i + v_i), \quad i = 1, 2, \dots, n, \quad (1)$$

where β_i ($i = 1, \dots, n$) are the parameter vectors of interest. Each indicator d_i depends on a vector of conditioning variables z through a binary mechanism

$$d_i = 1(z'\alpha_i + u_i > 0), \quad i = 1, 2, \dots, n, \quad (2)$$

where $1(\cdot)$ is a binary indicator function, α_i are parameter vectors, and u_i are random error terms. Denote error vectors $u' \equiv [u_1, u_2, \dots, u_n]$, $v' \equiv [v_1, v_2, \dots, v_n]$ and assume $[u', v']'$ is distributed as $(2n)$ -variate normal with zero mean and $2n \times 2n$ covariance matrix $\Sigma \equiv [\rho_{ij}\sigma_i\sigma_j]$, where ρ_{ij} are error correlation coefficients and σ_i are error standard deviations such that, for identification, $\sigma_1 = \sigma_2 = \dots = \sigma_n = 1$. Similar to Heckman's (1979) bivariate generalization of the univariate Tobit (Tobin, 1958), the model defined in (1) and (2) is a multivariate generalization of the Tobit system (Amemiya, 1974), in that censoring of each dependent variable y_i is not determined by a Tobit mechanism based on $x'\beta_i + v_i$ but by a separate sample selection process $z'\alpha_i + u_i$.

To present the estimation procedure, we denote the m -variate normal probability density function as $f_m(\cdot \cdot \cdot)$ for $m \geq 1$, and partition the error covariance matrix Σ at the n th row and column such that

$$\Sigma = \begin{bmatrix} \Sigma_{11} & \\ \Sigma_{21} & \Sigma_{22} \end{bmatrix}. \quad (3)$$

Consider first a regime in which observations of all dependent variables are positive (i.e., $y_i > 0$ for all i), characterized by the set of equations

$$\begin{aligned} z'\alpha_i + u_i &> 0, \\ y_i &= x'\beta_i + v_i, \quad i = 1, 2, \dots, n. \end{aligned} \quad (4)$$

Define an n -vector $r \equiv [z'\alpha_1, z'\alpha_2, \dots, z'\alpha_n]'$. Then, the likelihood contribution for this observation is

$$L_1 = \int_{u > -r} f_{(2n)}(u, v; \Sigma) du, \quad (5)$$

where v is an n -vector with elements $v_i = y_i - x'\beta_i$. The second regime is one in which the observations of all dependent variables are zeros (i.e., $y_i = 0$ for all i), characterized by

$$z'\alpha_i + u_i \leq 0, \quad i = 1, 2, \dots, n. \quad (6)$$

The likelihood contribution is

$$L_2 = \int_{u \leq -r} f_n(u; \Sigma_{11}) du. \quad (7)$$

Consider finally a mixed regime in which, without loss of generality, observations for the first ℓ dependent variables are positive and the rest are zeros ($y_i > 0$ for $i = 1, \dots, \ell$; $y_i = 0$ for $i > \ell$). This regime is characterized by the set of equations

$$\begin{aligned} z' \alpha_i + u_i &> 0, & y_i &= x' \beta_i + v_i, & i &= 1, \dots, \ell \\ z' \alpha_i + u_i &\leq 0, & & & i &= \ell + 1, \dots, n. \end{aligned} \quad (8)$$

Let \tilde{v} be an ℓ -vector with elements $y_i - x' \beta_i$. Then, $[u', \tilde{v}']'$ is $(n + \ell)$ -variate normal with zero mean and covariance matrix $\tilde{\Sigma}$ containing the first $n + \ell$ rows and columns of Σ . Define dichotomous n -vector $\kappa \equiv 2d - 1$ and $(n + \ell) \times (n + \ell)$ diagonal matrix $A = \text{diag}(-\kappa', 1, 1, \dots, 1)$. Then, the likelihood contribution is

$$L_3 = \int_{\eta \leq \text{diag}(\kappa)r} f_{(n+\ell)}(\eta, \tilde{v}; A' \tilde{\Sigma} A) d\eta. \quad (9)$$

Estimation can be done by maximizing the sample likelihood function, which is the product of the likelihood contributions L_1 , L_2 or L_3 across observations, depending on the regime for each observation. Partial integration of the normal densities in (5) and (9) can be evaluated using the procedure described in Pudney (1989, pp. 327–328), which requires evaluation of lower-tailed n -variate standard normal cumulative distribution functions as in (7).

Estimation and results

Using the FIML procedure described above, we estimated the parameters of (1) and (2). Notably, all explanatory variables appeared in both the sample selection and level equations with the exception of hours worked by the household manager. This approach is also taken in Byrne et al. (1998) who argue that market labor hours constrain the amount of time available for household production and may therefore have a positive effect on the decision to patronize a foodservice facility. However, once the decision to consume away-from-home is made, there is little basis to suggest that the number of hours worked would affect the expenditure level.

Parameter estimates for the censoring equations are presented in the first two pairs of columns of Table 2. We find that a household's likelihood of non-zero consumption is increasing in its income and in the number of hours worked by its manager for both fast food and full-service restaurants. Similarly, having a college-educated manager has a positive effect on a household's probability of visiting both types of restaurant. However, households with older managers are less likely to eat fast food and some minorities are less likely to consume both fast food and full-service food.

Estimation results for the level equations are presented in the third and fourth pairs of columns of Table 2. Statistically significant variables include proxies for income, household size, age of a household manager, education level of a household manager, a household's race, and a household's structure. As in other limited dependent variable models, prediction of and the effects of explanatory variables on the dependent variables can be based on the unconditional mean expression (Wales and Woodland, 1980)

$$E(y_i) = \Phi(z' \alpha_i) x' \beta_i + \sigma_{n+i} \rho_{n+i,i} \phi(z' \alpha_i), \quad i = 1, 2, \dots, n. \quad (10)$$

Table 2
FIML estimates of multivariate sample-selection model

Variable	Selection equations				Expenditure equations			
	Fast food		Full-service		Fast food		Full-service	
	Estimate	SE	Estimate	SE	Estimate	SE	Estimate	SE
Constant	1.333**	0.090	−0.344**	0.076	13.986**	0.994	−7.969**	2.194
Income	0.428**	0.055	1.235**	0.045	7.871**	0.342	29.411**	0.820
Income ²	−0.067**	0.013	−0.228**	0.011	−0.779**	0.037	−4.648**	0.206
Hours worked by manager	0.064**	0.007	0.027**	0.005				
Size of household	0.339**	0.142	−0.072	0.127	−6.423**	1.972	−9.784**	4.557
Age of manager	−0.152**	0.009	0.007	0.007	−2.019**	0.076	−0.095	0.146
College-educated manager	0.162**	0.034	0.259**	0.027	0.884**	0.294	4.186**	0.539
Single	−0.352**	0.056	−0.311**	0.048	2.002**	0.670	0.813	1.468
Single parent	−0.214**	0.052	−0.290**	0.048	−0.729	0.677	−3.361**	1.491
Multiple adults no children	−0.062	0.043	−0.015	0.037	1.081**	0.522	1.891*	1.099
Asian	−0.214**	0.06	−0.101**	0.050	0.751	0.571	0.111	1.048
Black	−0.202**	0.043	−0.530**	0.038	−0.434	0.458	−9.350**	0.960
Hispanic	−0.172**	0.044	−0.219**	0.039	−0.088	0.460	−2.726**	1.003
Midwest	0.083**	0.040	0.005	0.033	0.156	0.384	−1.265*	0.712
South	−0.069*	0.037	−0.099**	0.030	−0.066	0.358	−2.497**	0.660
West	0.058	0.040	−0.055*	0.032	−0.277	0.373	−1.861**	0.700
Winter	0.071**	0.035	0.051*	0.029	0.013	0.348	0.302	0.680
Spring	0.055	0.035	0.062**	0.029	0.863**	0.339	0.646	0.654
Summer	0.017	0.035	0.036	0.029	0.442	0.354	0.604	0.666
Year 1999	−0.105**	0.032	−0.045*	0.026	−0.402	0.313	−0.213	0.610
Year 2000	−0.120**	0.032	0.001	0.027	−0.424	0.309	0.536	0.601
Standard deviation (σ_i)					12.647**	0.024	23.132**	0.069
Error correlations								
Full-service – selection equation	0.119**	0.015						
Fast food – expenditure equation	0.830**	0.025	0.144**	0.009				
Full-service – expenditure equation	0.096**	0.013	0.967**	0.005	0.151**	0.006		
Log-likelihood	−90942.6							

Levels of significance: ** = 5%, * = 10%.

Elasticities of the unconditional mean with respect to explanatory variables z and x can be derived by differentiating (10); see Su and Yen (2000). We discuss the results below in combination with evidence on how the population of the US is changing.

Evaluating current trends in the marketplace

Using the results in Table 3, we can surmise how observed economic and demographic trends are likely affecting the growth of specific segments of the foodservice

Table 3

Elasticities of expenditures with respect to selected variables evaluated at sample means

Variable	Fast food	Full-service
Income	0.288	0.632
Hours worked by manager	0.039	–0.003
Size of household	–0.140	–0.150
Age of manager	–1.118	–0.029
College-educated manager	0.621	2.063
Single	1.708	0.480
Single parent	–0.384	–1.335
Multiple adults no children	0.949	1.066
Asian	0.614	0.063
Black	–0.261	–3.899
Hispanic	–0.004	–1.256

market. Based on research done at the BLS, we start by considering how the market would be affected if incomes were to continue rising and there were little or no change in how many hours are worked by household managers (Saunders and Su, 1999; Fullerton, 1999). We then consider demographic trends as identified in a recent study by the Economic Research Service (Cromartie, 2002). In that study, trends taking place in the population were shown to include rising education levels, the aging of households, decreasing household sizes, changes in the ethnic and racial mixture of the population, and changes in household structure.

This study and past analyses agree that trends in income impact on expenditures at both types of restaurant. As for actual changes in income over the past decade, the BLS estimates that real per capita disposable income increased by 1.2% per year on average between 1988 and 1998 (Saunders and Su, 1999). This trend should have lifted spending at both fast food and full-service restaurants. However, as shown in Table 3, spending on full-service food is somewhat more responsive to changes in income than spending for fast food. A 10% increase in a household's per capita income would lift its per person, weekly spending on the former by about 6.3% while increasing the latter by about 2.9%.

Trends in female labor force participation rate would also appear to influence household away-from-home expenditures to the extent that this variable is correlated with how many hours are worked by household managers. The BLS reports that 50% of women worked for wages in 1978. This number then rose to 56.6% in 1988. However, female labor force participation rate is now growing comparatively slowly. It stood at 59.8% in 1998 and is projected to reach 61.9% in 2008 (Fullerton, 1999). This study and past studies agree that such a trend would likely slow the growth rate in expenditures for fast food, but have little effect on spending for full-service meals and snacks.

As shown in Cromartie (2002), among demographic trends, more and more Americans are finishing college. For instance, people with a bachelor's degree or an even higher level of education amounted to 17% of the population in 1980 and 23.5% in 2000. It is predicted that this figure will reach 26.4% by 2020. Table 3 suggests that this trend is having a strong impact on spending at foodservice facilities. If

a household manager has a college education, then that household can be expected to spend about \$2.06 more per person each week at full-service restaurants than other households. It can also be expected to spend more on fast food, but the effect is smaller in this segment of the market, an increase of \$0.62.

American households are also becoming older. [Cromartie \(2002\)](#) argues that this trend is due to both rising life expectancy and the maturing of the “baby boomer” generation. It is estimated that 37.09% of the population was aged 20 to 44 in 1980. This figure fell to 37% in 2000 and will hit 32.5% by 2020. Over the same time, people aged over 65 years increased from 11.23% of the population in 1980 to 12.4% in 2000. By 2020, such people will account for 16.5% of all Americans. The results in [Table 3](#) suggest that this trend is impacting negatively on the fast food segment of the market. A 10% increase in the age of a household manager is associated with an 11.2% decrease in their household’s per capita weekly spending for fast food. However, the same household’s expenditures at full-service restaurants would not be affected much.

Households in the US are becoming smaller. Household sizes averaged 2.8 persons in 1980, 2.5 persons in 2000, and will likely fall to just 2.4 persons by 2020 ([Cromartie, 2002](#)). The findings of this study suggest that decreasing household sizes should increase per capita weekly spending at restaurants in general. A 10% decrease in household size would lift these expenditures at fast food and full-service restaurants by about 1.4% and 1.5%, respectively.

[Cromartie \(2002\)](#) also shows that traditional households totaled 30.2% of all households in 1980, 23.5% in 2000, and will likely amount to just 16.7% by 2020. Concurrently, increases are occurring in the percentage of households containing only a single person or containing multiple adults without live-at-home children. These changes should be lifting restaurant sales in general. Households with multiple adults and no children spend about \$1.00 more per person per week at both types of establishments. However, fast food operators might benefit most from the growth of single person households. Each week, single people spend about \$1.71 more on fast food and about \$0.48 more on full-service food than their traditional counterparts do on a per capita basis.

Finally, [Cromartie \(2002\)](#) shows that immigration is driving rapid growth in the number of people considering themselves to be Hispanic or Asian. It is estimated that Hispanic people accounted for 6.5% of the population in 1980 and 12.6% in 2000. By 2020, such people will total 18% of all Americans. The Asian population is also growing. It is predicted that 1.5% of Americans were Asian in 1980 and 3.9% in 2000. This number will probably reach 5.8% by 2020. By contrast, growth in the Black population will likely depend upon the difference between domestic births and deaths. Such people accounted for 11.6% of the population in 1980, 12.4% in 2000, and are expected to total 12.9% of all Americans in 2020. These changes will impact on food markets. According to [Table 3](#), increases in the Hispanic population could reduce per capita weekly sales of full-service meals and snacks. By contrast, growth in the Asian population could lift per capita sales of fast food.

Economic and demographic trends appear to be driving changes in the relative growth of the full-service and fast food restaurant industry segments. To be sure,

identified demographic trends do not all agree in the direction of their likely impact. Most notably, increases in minority populations may support the fast food market segment relative to the full-service segment. However, rising incomes, a slowing in the growth rate of female labor force participation, aging, and rising education levels all appear to favor the full-service category of restaurants. Overall, this result is consistent with perceived market trends as expressed by the [National Restaurant Association \(1999\)](#).

Conclusions

This study has used an innovative FIML procedure to identify how key economic and demographic variables impact on a household's expenditure away-from-home by type of facility. We then combined these findings with projections on how the population is changing. It was found that developments are likely driving a shift in the fortunes of full-service and fast food restaurant companies. Moreover, because many of these trends are likely to remain stable over the next several decades, the results of the study suggest that the relative strength of the full-service segment is likely to grow. Thus, to the extent that consumption and expenditures are correlated, Americans can be expected to consume relatively more meals and snacks at full-service restaurants in the future.

However, any change in market share between the fast food and full-service restaurant segments will also depend on adjustments in what goods and services restaurants chose to offer.⁵ In particular, as trends in demand favor full-service restaurants, economic theory predicts that the market could soon include more full-service restaurants offering more varied menus and a wider range of dining amenities. Fast food restaurants might also introduce many of these same foods and services themselves. From an industry point of view, menus and services must adjust to meet changes in consumer demand.

There is much anecdotal evidence that some fast food restaurants are supplying more of the foods and services traditionally associated with full-service dining. For example, many Subway restaurants accept debit and credit cards. Now, McDonald's has announced that some of its restaurants will likely begin to accept credit or debit card purchases. Both companies have also expanded the number of items on their core menu in recent years. At McDonald's restaurants, for one, Big Macs™ are now sold alongside newer products like breakfast bagels, salads, fruit and yogurt parfaits, and soft-serve ice cream with candy mix-ins.

There is also the behavior of full-service restaurant companies to consider. These companies could both open more outlets as well as offer more variety and dining amenities at each establishment. In fact, in 2001, mid-scale, full-service restaurants

⁵ We might also expect changes in what retailers of at-home foods sell. In fact, as consumers increasingly use supermarket stores to purchase meal solutions (e.g., ready meals and snacks) as opposed to food ingredients, it could be argued that the away-from-home and at-home food markets are on a convergence course as well.

were offering 31.6% more items on their menu than in 1997 (Yee, 2001). They were also increasing the scope of their services, including new options for take-out. These options could better allow full-service restaurants to provide the varied menus associated with full-service dining without sacrificing the convenience associated with fast food. In other words, full-service restaurants may try to capture the growing demand for varied menu items among consumers who also remain time-starved.

It is curious that some critics of the foodservice industry appear to be targeting fast food chains. This study suggests that, if social marketers with health-oriented government agencies wish to promote healthy eating, they may want to focus any initiatives on eating out in general, including both full-service and fast food dining. It is already known that consumers are spending more of their food dollar away-from-home. This study has further shown that they will likely be purchasing relatively more of the items traditionally associated with full-service dining, perhaps at both full-service and fast food restaurants.

This study also underscores the importance of considering household characteristics in designing social marketing campaigns. Clearly, convenience is important to today's consumer. Jekanowski et al. (2001) have shown that the fast food industry grew for several decades by building more outlets closer to where people live and work. Increased accessibility enhanced the convenience associated with fast food. However, what people buy away-from-home may now depend as much on rising incomes and changes in family structure. These forces will also shape how often people eat out, and what sorts of foods they are likely to buy.

A current social marketing campaign, the Power of Choice, teaches adolescents how to make healthful decisions vis-à-vis fast food restaurants. Now, the US Food and Drug Administration plans to target the broader population by working with restaurants to develop a method for providing restaurant patrons with more information about the nutritional qualities of menu items (US Food and Drug Administration, 2004). Unfortunately, studies have found that providing information alone may have little impact on what menu items patrons chose (e.g., Patterson et al., 2002). To improve upon the efficacy of any nutrition information program, the findings of this study suggest how social marketing initiatives might be used. In particular, if, as this study suggests, a desire for leisurely dining occasions with a greater variety of menu items underlies consumer behavior, then social marketers may want to further work with restaurants to provide tasty and healthful menu items. They may also need to encourage consumers to try these same items.

In conclusion, the relative growth of the fast food segment appears to have stalled. With a few exceptions, trends in the population appear to favor full-service dining. However, any changes in market share between the two segments will also depend on other factors, such as how firms in both market segments change the mix of foods and service supplied to their customers. In fact, restaurants in both segments of the market can be expected to provide more of the meals and snacks traditionally provided by full-service restaurants. In this environment, an emphasis on the role of fast food, or any other particular segment of the restaurant industry, in improving the Nation's health does not appear to make sense. Social marketers with health-oriented government agencies, in particular, may want to take a more balanced view

of away-from-home eating, if they wish to best improve upon the health of the American population.

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